

LETTER OF REVIEW

PARAHO OIL SHALE

7-30-82

PRO/047/003

Soil Removal

Rule M-10(14)

Rule M-3(1)(f)

A map should be provided which relates soil series and/or complex and available soil depth to soils to be salvaged. The applicant should relate the location of surface facilities and areas to be disturbed to this map.

On page 28 and 32 of the "Reclamation Plan" the applicant alludes to the segregation of topsoil and subsoil. In a Lithic Topsoil there is little definition by horizon is observed as these are shallow soils. Possibly a slight color and pH change might be observed. What criteria would be used to achieve this separation of topsoil and subsoil occur and is it economically justifiable to do this?

The applicant states in Section 3.3 "Soils" of the "Permit Application" that Walkrolls are low in nitrogen and phosphorous. Nothing with regard to fertility states of the Otero-Gilson complex is indicated. Please provide more baseline soils data. Data should include, but not be limited to, soil texture, pH, electrical conductivity, sodium absorption ratio, boron, iron, lead, molybdenum, selenium, zinc, available nitrogen, phosphorous and potassium, soluble calcium, magnesium and sodium. Sampling should be performed by depth, especially in the Gilson series where the indication is that soils get "extremely saline at depth". This information will assist in proper handling of soil materials.

Soil Protection:

What measures will be employed to achieve adequate topsoil stockpile protection? Will drainage be diverted away from piles? Will berms be used to retain soil? Will terraces employed on soil stockpiles? Will seeding and/or mulching be utilized or will other surface stabilizing agents or measures be used?

How will the development and protection of topsoil stockpiles be correlated with table 4.10. Once a stockpile is established, protected and revegetated, it is usually not desirable to disturb it prior to its redistribution. Given the sequence of activities associated with the disturbance attendant to the proposed fines and retorted shale pile expansion, how will stockpiling activities be correlated to stockpile locations given the desire to minimize the disturbance of existing, protected topsoil stockpiles? Which stockpiles will be increased in volume concurrent with raw shale fines disposal area development and retorted shale disposal area development and which will be static with regard to volume?

1. What is the anticipated final depth of each of the stockpiles?
2. What will be the probable dimension of each stockpile at its greatest extent?
3. What will be the slope of the stockpiles? Will terraces be employed?

The applicant may best address these concerns by providing topsoil stockpile configurations and cross sections.

Rule M-3(i)(e)(g)

Four surficial soils stockpile sites are indicated along with volume estimations for each site (pages 32 and 33). Only 2 of these sites appear on the surface maps. Please provide an accurate map.

Please expand on the use of rip-rap on topsoil embankments in light of soil protection. To what extent would rip-rap cover the soil? How would it be segregated from the soil prior to redistribution? What effect would its use have on the biological integrity of the stockpile? A diverse stand of vegetation can enhance the soil prior to its use for reclamation, thus making it more likely to facilitate revegetation efforts.

Soil Redistribution

In the "Soil Replacement" section (page 42), the applicant states that 6 inches of coarse material will be used as a buffer strip to prevent upward migration of salts from "saline and sodic waters from the piles".

1. What assurance is there there that this is enough material to accomplish this?
2. It is stated that "Fines from rock rip-rap grading process may be suitable" for this. How was this determined?
3. What is the chemical nature of this material? Is it saline or sodic?

The applicant states that 14 inches of soil will be used to cover the above material as well as all graded surfaces?

1. The implication is that soils will be replaced in the area from where they were stripped? Is this correct? If so, how will this be ensured?
2. The applicant states that the mine operation area will be 705 acres. To replace soil to a depth of 14 inches, the operator would require 1,326,967 cubic yards of soil. This leaves a deficit of approximately 270,000 cubic yards. Please clarify.

3. The above does not account for the roads or drainage systems. What are the reclamation plans for these areas?

On page 42 the applicant states that soil compaction which occurs incident to regrading, will approximate that in "layers in natural surrounding soils". What is the baseline bulk density of the surrounding soil? What method(s) will be employed to measure compaction after regrading?

On page 47 the applicant alludes to the possibility of winter soil redistribution with spring seed bed preparation. The Division is of the opinion that these activities should occur in fall for the the following reasons:

1. The moisture content of soils would be maximum during winter spring redistribution activities. This increases the likelihood of excess soil compaction and negative effects on soil structure.
2. Wind and rainfall patterns may be such that the potential for excessive erosion would be heightened.
3. Handling soils at these times would result in greater exposure of soil (more surface area) thus loss of valuable soil moisture critical to seed germination.

Rule M-3 (2)(c)  
M-10(6)

More detail is needed on waste rock handling. The applicant states that all waste rock will be used as rip-rap (page 35). What will be the duration of this intended usage? How does it relate to the regrading plans on site abandonment? Will this volume be required to achieve approximate original contour (page 38)? In either event, the Division requires information concerning its potential chemical effect on revegetation and/or runoff water quality. If it is highly saline or alkaline it could have adverse effects. Possibly a minimal sampling scheme (pH and EC) could provide an indication as to the necessity of performing additional tests.

Rule M-10(12)

Will any contemporaneous reclamation of the retorted shale disposal area be carried out?

Why was a sprinkler system chosen as opposed to another form of irrigation? The efficiency of water use could be improved by utilizing a trickle irrigation system. Please comment.

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July 30, 1982  
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General Comments

On page 37 operator states that no subsidence is anticipated based on 40 years experience at Anvil Points. This does not seem adequate.

Do they need a map to describe AOC if they have the original contours and commit to AOC page 38?